

## ABSTRACT

According to this invention, silicon-based photodetectors using waveguides formed with silicide regions can have high speed and high efficiency for near IR applications. Utilizing the unique properties of silicides, the proposed method provides a simple and elegant way to implement a photodetector design in which photogenerated carriers travel perpendicular to the direction of light propagation. Therefore, the speed and quantum efficiency of the photodetector may be optimized independently. This device configuration may be implemented in one of the two approaches: (a) waveguides formed through surface silicidation of a silicon-based layer of a substrate (b) waveguides formed through silicidation of ridge waveguide side-walls of a silicon-based layer of a substrate; The use of mature silicon technology promises low cost of production and other benefits.